

**REMARKS**

Reconsideration of the application, as amended, is respectfully requested.

**I. STATUS OF CLAIMS**

Claims 1-36 are pending in this application. Claims 14, 16 and 25 have been amended to more clearly point out and distinctly claim that which the applicants regard as their invention. New claims 34-36 have been added.

It is respectfully submitted that no new matter has been added by virtue of this amendment. Support for the amended claims and new claims can be found throughout the specification as originally filed. In particular, support for amended claim 14 and 25 may be found, for example, in claim 1 as originally filed and on page 8, paragraph 0034 and page 11, paragraph 0048 and Fig. 4 of the present specification. Support for new claims 34-36 may be found throughout the specification as originally filed and in particular in Fig. 4 of the present specification.

**II. 35 U.S.C. 102(e) REJECTIONS**

The Examiner rejected claims 1-2, 4, 9-12, 25-27, and 30-33 as being anticipated by U.S. Patent No. 6,377,593 to Peterson et al. ("the Peterson patent").

In response, it is respectfully asserted that the Peterson patent fails to teach or suggest all of the limitations recited in independent claim 1 and amended independent 25 of the presently claimed invention.

Specifically with regard to claim 1, this claim recites: " A monolithic, side pumped, passively Q-switched, solid-state laser comprising a laser resonator composite structure comprised of a laser gain medium optically contacting a passive Q-switch, wherein the composite structure comprises end faces forming a linear optical path resonant cavity

therebetween, the end faces comprising at least partially reflecting coatings deposited thereon, the gain medium comprising a side face for receiving pump light."

In contrast, the Peterson patent is directed to a Q-switched microlaser which supports a zig-zag resonance pattern within a microresonator cavity in response to side pumping of the active gain medium. Moreover, the primary purpose of the Peterson patent is to produce a microlaser which when its active gain medium is side pumped establishes a zig-zag resonance pattern within the microresonator cavity, in order to effectively lengthen the microresonator cavity without having to actually physically lengthen the microresonator cavity. ( See column 2, lines 35-48 of the Peterson patent). The zig-zag resonance patterns within the microresonator cavity of the microlaser of Peterson are illustrated by the dashed lines in figures 1 and 2 in that patent.

As can be clearly seen from the above, the Peterson patent fails at the very least to teach or suggest a monolithic, side pumped, passively Q-switched, solid-state laser comprising a laser resonator composite structure comprised of a laser gain medium optically contacting a passive Q-switch, wherein the composite structure comprises end faces forming a linear optical path resonant cavity therebetween...", as recited in claim 1. Rather, as discussed, the Peterson patent relates only to side pumped, Q-switched, microlasers which have zig-zag resonance patterns formed within its microresonator cavity, but not linear optical paths occurring within the resonant cavity, as required by claim 1. While the Peterson patent does mentions linear optical paths in discussing conventional prior art laser systems it only does so with regard to end pumped microlasers but not with respect to side pumped lasers, as required by claim 1. Moreover, the distinction between side pumped solid state laser supporting a linear optical path ( i.e. claim 1) within a resonant cavity as opposed to side pumped solid state lasers supporting a zig-zag resonant pattern within the resonator cavity is highly significant. For example as discussed on page 2, paragraph 0007 and page 3 paragraph 0008 of the present specification, microlasers which utilize "zig zag" optical paths such as those described in the Peterson patent are more difficult to produce in large quantities than straight through

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slab embodiments ( i.e. side pumped solid state lasers having a linear optical path within the resonant cavity of the laser), and are therefore more costly to manufacture and control. Moreover, the side pumped lasers of the presently claimed invention as recited in claim 1 which provide the linear optical path resonant cavity design are also simpler to manufacture, require fewer steps in producing the laser and require fewer parameters to evaluate for accepting or rejecting the laser than side pumped lasers which utilize a zig-zag optical path such as those described in the Peterson patent ( **See page 11, paragraph 0048 of the present specification**).

The Examiner is respectfully reminded that for a rejection to be made on the basis of anticipation, it is well recognized that "to constitute anticipation, all material elements recited in the claim must be found in one unit of prior art," *Ex Parte Gould*, BPAI, 6 USPQ 2d, 1680, 1682 (1987), citing with approval *In re Marshall*, 578 F.2d 301, 304, 198 USPQ 344, 346 (CCPA 1978). Since the Peterson patent fails to each and every element of the presently claimed invention as recited in claim 1, for the reasons set forth above, a withdrawal of the above rejection to claim 1 is therefore respectfully requested. Moreover, since claims 2, 4 and 9-12 depend from and incorporate all of the limitations of independent claim 1, withdrawal of the above rejection to these dependent claims is also respectfully requested.

Next, with regard to amended independent claim 25, this claim recites: "A solid-state laser comprising a laser resonator composite structure comprised of a laser gain medium, wherein the composite structure comprises at least two surfaces forming a linear optical path resonant cavity therebetween, and at least one surface of the at least two surfaces is adapted for thermal aberration compensation."

Initially, it is noted that claimed 25 has been amended herein to further clarify that the resonant cavity formed between the at least two surfaces of the composite structure is

a linear optical path resonant cavity.

In response to the Examiners rejection, it is respectfully asserted that the Peterson patent fails at the very least to teach or suggest a solid-state laser comprising a laser resonator composite structure comprised of a laser gain medium, wherein the composite structure comprises at least two surfaces forming a linear optical path resonant cavity therebetween...", as recited in claim 25. As mentioned above, the Peterson patent only describes side pumped, Q-switched, microlasers which have zig-zag resonation patterns formed within its microresonator cavity, but not linear optical patterns, as required by claim 25. Thus, the Peterson patent fails to teach or suggest each and every element of claim 25 of the presently claimed invention.

For the reasons set forth above, a withdrawal of the above rejection to amended independent claim 25 is therefore respectfully requested. Moreover, since claims 26, 27 and 30-33 depend from and incorporate all of the limitations of independent claim 25, withdrawal of the above rejection to these dependent claims is also respectfully requested. New claim 34 is likewise patentable over the Peterson patent as well, since this new claim depends from and incorporates all of the limitations of claim 1.

### **III. 35 U.S.C. 103(a) REJECTIONS**

The Examiner rejected claims 3, 5-8, 14-24 and 28 under 35 U.S.C. 103 as being unpatentable over the Peterson patent.

In response, Applicants respectfully assert that the Peterson patent fails to teach or suggest all of the limitations of claims 3, 5-8 and 28. Namely, as discussed above with regard to claims 1 and 25, the Peterson patent only describes side pumped, Q-switched, microlasers which have zig-zag resonation patterns formed within its microresonator

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cavity, but not linear optical paths formed within the cavity. Since claims 3, 5-8 depend from and incorporate all of the limitations of independent claim 1 and claim 28 depends from and incorporate all of the limitations of independent claim 25, the Peterson patent likewise also fails to teach or suggest each and every element of these dependent claims as well. Therefore, withdrawal of the above rejection to these dependent claims is also respectfully requested.

With regard to the Examiner's rejection of independent claim 14, it is initially noted that claim 14 has been amended to further clarify that the composite structure comprises end faces that form a linear optical resonant cavity therebetween.

Now in response to the rejection of claim 14, it is respectfully asserted that the Peterson fails to teach or suggest the method for fabricating a monolithic, side pumped, passively Q-switched, solid state laser as recited in amended independent claim 14. Namely, as mentioned above, the Peterson only describes side pumped, Q-switched, microlasers which have zig-zag resonation patterns formed within its microresonator cavity, but not side pumped microlasers which have linear optical path resonant cavities, as required by amended independent claim 14. Therefore, the Peterson patent fails to teach or suggest all of the limitations of amended claim 14.

For the reasons set forth above, a withdrawal of the above rejection to claim 14 is therefore respectfully requested. Since claims 15-24 depend from and incorporate all of the limitations of amended claim 14, the Peterson patent likewise also fails to teach or suggest each and every element of these dependent claims. Therefore, withdrawal of the above rejection to these dependent claims is also respectfully requested. New claim 35 is likewise patentable over the Peterson patent as well, since this new claim depends from and incorporates all of the limitations of claim 14.

The Examiner also rejected claims 13 and 29 under 35 U.S.C. 103 as being unpatentable over the Peterson patent in view of U.S. Patent No. 5,847,871 to Sumida et

al. ("the Sumida patent"). The Examiner alleges that all of the limitations of these claims are disclosed by the Peterson patent, with the exception of the Porro prism recited in these claims. However, the Examiner states that the Sumida patent teaches a laser system incorporating a Porro prism and further takes the position that it would have been obvious to one skilled in the art to include the Porro prism for optical efficiency, as taught by the Sumida patent.

The Sumida patent relates to monolithic multifunctional optical elements which may be employed in Q-switched lasers, and was cited by the Examiner against claims 13 and 29 for its description of Porro prisms. Nevertheless, even if the Porro prisms described in the Sumida patent were incorporated into the microlasers of Peterson, one would still not arrive at the presently claimed invention as recited in claims 13 and 29. Rather, what one skilled in the art would produce from this combination would be a side pumped, Q-switched, microlaser being used in conjunction with a Porro prism, and wherein zig-zag resonation patterns would be formed within the microresonator cavity of the microlaser. In other words, the Porro prism of Sumida would not change the zig-zag resonant pattern occurring within the microresonator cavity of Peterson discussed above. However, since the side pumped lasers of claims 13 and 29 which depend from and incorporate all of the limitations of independent claims 1 and 25, respectively require linear optical path resonant cavities, the combination of Sumida with the Peterson patent fails to teach or suggest all of the limitations of claims 13 and 29. A further distinguishing characteristic between claims 13 and 29 and the Peterson/Sumida combination, is that the Porro prism recited in claims 13 and 29 is incorporated directly into the solid state laser. ( See Fig. 6 of the present specification). In contrast, the Sumida patent describes the Porro prism as being a separate element from the laser.

For the reasons set forth above, a withdrawal of the above rejection to claims 13 and 29 is therefore respectfully requested. New claim 36 is likewise patentable over the Peterson/Sumida patent combination as well, since this new claim depends from and incorporates all of the limitations of claim 25.

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**IV. CONCLUSION**

In view of the actions taken, it is believed that all pending claims as currently presented are in condition for allowance. A notice of allowance is respectfully requested.

According to currently recommended Patent Office policy, the Examiner is requested to contact the undersigned at the telephone number provided below in the event that a telephone interview will advance the prosecution of this application. An early and favorable action is earnestly solicited.

Further, a petition for a one month extension of time, along with a check in the amount of \$55.00 covering the petition fee are enclosed herewith. In addition, a check in the amount of \$27.00 is enclosed which covers the additional claims fee for the three new dependent claims added as a result of this amendment. It is noted that the applicant is a small entity and is thus entitled to the reduced petition fee and added claims fee. No other fees are believed due with this amendment. However, if there are any additional fees due, then please charge them to deposit account no.: 50-1924.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Scott L. Appelbaum", is written over a horizontal line.

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